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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,418	02/06/2004	Burton H. Sage JR.	080219/0105	2059
22428	7590	01/13/2006	EXAMINER	
FOLEY AND LARDNER LLP			ALSOMIRI, ISAM A	
SUITE 500			ART UNIT	
3000 K STREET NW			PAPER NUMBER	
WASHINGTON, DC 20007			3662	

DATE MAILED: 01/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/772,418	<b>Applicant(s)</b> SAGE ET AL.	
	<b>Examiner</b> Isam Alsomiri	<b>Art Unit</b> 3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 22-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 and 18 November 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to because the figures should include descriptive labeling to help in understanding the figures (for example figure 1 [17] should be labeled as a Microprocessor). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

New corrected Formal drawings in compliance with 37 CFR 1.121(d) are required in this application. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office

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action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 22, 25-26, 30-35, 41-43 are rejected under 35 U.S.C. 102(a or e) as being anticipated by Yin et al. US006386050B1.**

Referring to claims 22 and 33, Yin discloses in figure 1 a liquid metering device comprising: a conduit (10 12) adapted to permit liquid to flow through the conduit, a portion of the conduit having a wall 44 through which light may pass; a liquid heater (20,22) adapted to heat a portion of the liquid at a first position along the conduit; a light source adapted to generate at least one beam; a beam splitter (wall of the conduit) adapted to split the at least one beam into a first beam directed along a first path through the wall at a second position along the conduit and a second beam directed along a second path around the conduit (does not go through the wall); a device adapted to combine the first and second beams after the first beam has passed through

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the conduit such that the first and second beams undergo a degree of interference (both beams will naturally combine through the medium; and an optical detector 28 adapted to detect an intensity variation of the combined first and second beams caused by a heated portion of the liquid passing through the first beam (see Abstract and col. 6 line 63 – col. 7 line 8).

Referring to claims 25 and 34, it's inherent that the wall the wall is a glass wall or a polymer wall (see col. 5 lines 49-64).

Referring to claims 26 and 35, Yin teaches the liquid metering system of wherein the portion of the conduit has a lumen with a rectangular or square cross section (see figure 1).

Referring to claims 30-31 and 42-43, Yin teaches a processor 18 adapted to determine the speed at which the liquid is passing through the conduit based on the time between the point at which fluid begins to flow through the conduit and the time that the optical detector detects an intensity variation of the combined first and second beams (see col. 6 line 63 – col. 7 line 8).

Referring to claims 32 and 41, Yin teaches the detector detects a change in the degree of interference caused by the heated portion of the liquid passing through the first beam (see col. 6 line 63 – col. 7 line 8).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yin et al. US006386050B1 in view of Kerlin, Jr. US 4,777,368.** Yin does not teach the liquid heater is an infrared laser. Kerlin teaches a similar system wherein the heater is a contactless infrared laser (see Abstract lines 1-5). It would have not been obvious to modify Yin to replace the thermal heater with a infrared laser as a another alternative way to achieve the same end without any contacts by the heater.

**Claim 22-26 and 28-43 rejected under 35 U.S.C. 103(a) as being unpatentable over Yin et al. US006386050B1 in view of C. C. Johnson US 3,511,227.** Referring to claims 22 and 33, Yin discloses in figure 1 a liquid metering device comprising: a conduit (10 12) adapted to permit liquid to flow through the conduit, a portion of the conduit having a wall 44 through which light may pass; a liquid heater (20,22) adapted to heat a portion of the liquid at a first position along the conduit; a light source adapted to generate at least one beam. Even if Yin is interpreted to not disclose a beam splitter adapted to split the at least one beam into a first beam directed along a first path through the wall at a second position along the conduit and a second beam directed along a second path around the conduit and a device adapted to combine the first and second beams after the first beam has passed through the conduit such that the first and second beams undergo a degree of interference. Johnson teaches a similar system wherein including the claimed beam splitter 36 adapted to split

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the at least one beam into a first beam directed along a first path through the wall at a second position along the conduit (32 – 10) and a second beam (34) directed along a second path around the conduit and a device 48 adapted to combine the first and second beams after the first beam has passed through the conduit such that the first and second beams undergo a degree of interference (inherent). It would have not been obvious to modify Yin's system to include the beam splitter and the combiner as a mere alternative to beam being split by the wall of the conduit. The combination of Yin and Johnson teaches an optical detector (28-Yin) adapted to detect an intensity variation of the combined first and second beams caused by a heated portion of the liquid passing through the first beam (see Abstract and col. 6 line 63 – col. 7 line 8).

Referring to claims 23-24 and 38-40, the combination teaches element 46 (filter) which broadly reads on the claimed optical phase delay element in the first path, which is separate from the conduit (see figure 1 Johnson).

Referring to claims 25 and 34, it's inherent that the wall the wall is a glass wall or a polymer wall (see col. 5 lines 49-64 Yin)

Referring to claims 26 and 35, Yin teaches the liquid metering system of wherein the portion of the conduit has a lumen with a rectangular or square cross section (see figure 1 Yin).

Referring to claims 28 and 36, it is inherent that the light used in Johnson is visible light. However, even if it is not inherent, using visible light is well known and It would have not been obvious to use a mere alternative way.

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Referring to claims 29 and 39, Yin does not teach the light source is coherent. Johnson teaches using coherent light. It would have not been obvious to modify Yin's system to use coherent light accurate variations (due to interference) detection of the detected light.

Referring to claims 30-31 and 42-43, Yin teaches a processor 18 adapted to determine the speed at which the liquid is passing through the conduit based on the time between the point at which fluid begins to flow through the conduit and the time that the optical detector detects an intensity variation of the combined first and second beams (see col. 6 line 63 – col. 7 line 8 Yin).

Referring to claims 32 and 41, Yin teaches the detector detects a change in the degree of interference caused by the heated portion of the liquid passing through the first beam (see col. 6 line 63 – col. 7 line 8 Yin).

**Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yin et al. US006386050B1 in view of C. C. Johnson US 3,511,227 and Kerlin, Jr. US 4,777,368.** Yin does not teach the liquid heater is an infrared laser. Kerlin teaches a similar system wherein the heater is a contactless infrared laser (see Abstract lines 1-5). It would have not been obvious to modify Yin to replace the thermal heater with a infrared laser as a another alternative way to achieve the same end without any contacts by the heater.



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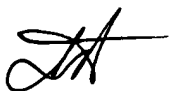
**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isam Alsomiri whose telephone number is 571-272-6970. The examiner can normally be reached on Monday-Friday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isam Alsomiri



January 6, 2006



THOMAS H. TARCZA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600